

WE CLAIM:

1. A process for making an absorbent composite web, comprising the steps of:

providing a first superabsorbent polymer precursor composition;

providing a pre-formed fibrous web including a plurality of hydrophilic fibers;

adding the first superabsorbent polymer precursor composition to the fibrous web using a non-contact process; and

chemically reacting the first superabsorbent polymer precursor composition on or in the fibrous web to form a superabsorbent polymer.

2. The process of Claim 1, wherein the superabsorbent polymer precursor composition is applied as microdroplets having a diameter of about 10-1000 microns.

3. The process of Claim 2, wherein the microdroplets have a diameter of about 50-500 microns.

4. The process of Claim 2, wherein the microdroplets have a viscosity of about 5-1000 centipoise.

5. The process of Claim 2, wherein the microdroplets have a viscosity of about 10-500 centipoise.

6. The process of Claim 2, wherein the microdroplets have a viscosity of about 20-100 centipoise.

7. The process of Claim 1, further comprising the steps of:
providing a second superabsorbent polymer precursor composition;
adding the second superabsorbent polymer precursor composition to the fibrous web using a non-contact process; and
chemically reacting the first and second superabsorbent polymer precursor compositions together on or in the web to form the superabsorbent polymer.

8. The process of Claim 7, wherein the first and second superabsorbent polymer precursor compositions are added separately to the fibrous web.

9. The process of Claim 1, wherein the first superabsorbent polymer precursor composition is applied by spraying.

10. The process of Claim 1, wherein the first superabsorbent polymer precursor composition is applied using a non-contact printing process.

11. The process of Claim 1, wherein the fibrous web further comprises a plurality of thermoplastic fibers.

12. The process of Claim 1, wherein the hydrophilic fibers comprise cellulose fibers.

13. The process of Claim 1, wherein the hydrophilic fibers comprise absorbent fibers.

14. The process of Claim 1, wherein the hydrophilic fibers comprise staple fibers.

15. A process for making an absorbent web composite, comprising the steps of:

providing a starting web including about 25-100% by weight cellulose fibers and about 0-75% by weight thermoplastic fibers;

providing a first superabsorbent polymer precursor composition;

applying the first superabsorbent polymer precursor composition to the web using a non-contact printing process; and

chemically reacting the first superabsorbent polymer precursor composition on or in the web to form a superabsorbent polymer.

16. The process of Claim 15, wherein the starting web comprises about 50-100% by weight cellulose fibers and about 0-50% by weight thermoplastic fibers.

17. The process of Claim 15, wherein the starting web comprises about 60-90% by weight cellulose fibers and about 10-40% by weight thermoplastic fibers.

18. The process of Claim 15, wherein the thermoplastic fibers comprise meltblown fibers.

19. The process of Claim 15, wherein the thermoplastic fibers comprise spunbond fibers.

20. The process of Claim 15, wherein the superabsorbent polymer comprises a polymer selected from alkali metal and ammonium salts of poly(acrylic acid) and poly(methacrylic acid), poly (acrylamides), poly(vinyl ethers), maleic anhydride copolymers with vinyl ethers and alpha-olefins, poly(vinyl pyrrolidone), poly(vinyl morpholinone), poly(vinyl alcohol), and combinations thereof.

21. The process of Claim 15, wherein the absorbent web composite comprises about 1-75% by weight of the superabsorbent polymer.

22. The process of Claim 15, wherein the absorbent web composite comprises about 15-65% by weight of the superabsorbent polymer.

23. The process of Claim 15, wherein the absorbent web composite comprises about 20-50% by weight of the superabsorbent polymer.

24. A process for making an absorbent web composite, comprising the steps of:

providing a first superabsorbent polymer precursor composition including a monomer;

providing a second superabsorbent polymer precursor composition including a polymerization initiator;

providing a pre-formed fibrous web including a plurality of cellulose fibers;

adding the first superabsorbent polymer precursor composition to the fibrous web using a non-contact process;

separately adding the second superabsorbent polymer precursor composition to the fibrous web using a non-contact process; and

chemically reacting the first and second polymer precursor compositions on or in the fibrous web to form a superabsorbent polymer.

25. The process of Claim 24, wherein the polymerization initiator comprises a redox system.

26. The process of Claim 24, wherein the monomer comprises a compound selected from the group consisting of aliphatic unsaturated monocarboxylic acids and their salts, methacrylic acids and their salts, unsaturated dicarboxylic acids and their salts, and combinations thereof.

27. The process of Claim 24, wherein the monomer comprises a compound selected from the group consisting of acrylic acid and its salts, methacrylic acid and its salts, and combinations thereof.